

Name: _____

Date: _____

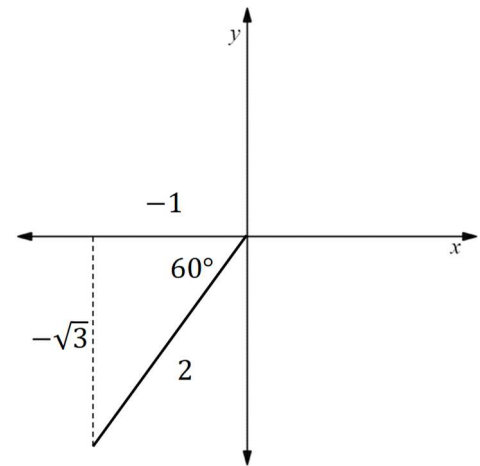
Learning Goal 2.2

Using trigonometric ratios and solving simple trigonometric equations.

1. Determine the exact value of
- $\sin 240^\circ$
- .

 240° is in quadrant III so $\theta_R = 240^\circ - 180^\circ = 60^\circ$

$$\begin{aligned}\sin 240 &= \frac{y}{r} \\ &= -\frac{\sqrt{3}}{2}\end{aligned}$$

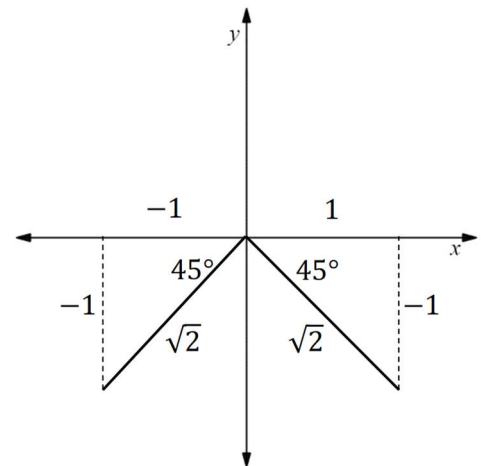


2. Solve
- $\sin \theta = -1/\sqrt{2}$
- ,
- $0^\circ \leq \theta < 360^\circ$

The sine ratio is negative in quadrants III and IV (so two solutions in the given range of values), and the value indicates that we need to consider the $45^\circ - 45^\circ - 90^\circ$ special triangle.

$$\begin{aligned}\theta_1 &= 180^\circ + 45^\circ \\ &= 225^\circ\end{aligned}$$

$$\begin{aligned}\theta_2 &= 360^\circ - 45^\circ \\ &= 315^\circ\end{aligned}$$



3. Solve $\tan \theta = -1$, $-360^\circ \leq \theta < 360^\circ$

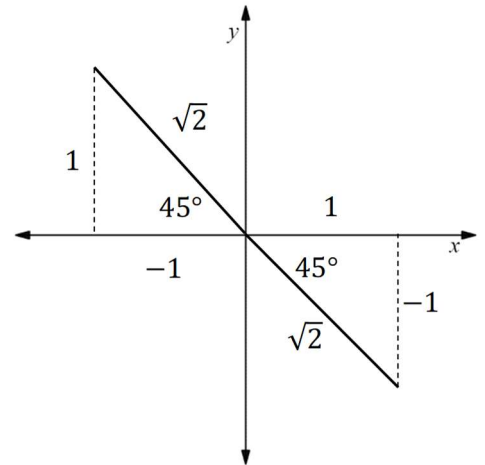
The tangent ratio is negative in quadrants II and IV (so four solutions in the given range of values) and the value indicates that we need to consider the $45^\circ - 45^\circ - 90^\circ$ special triangle.

$$\begin{aligned}\theta_1 &= -180^\circ - 45^\circ \\ &= -225^\circ\end{aligned}$$

$$\begin{aligned}\theta_2 &= 0^\circ - 45^\circ \\ &= -45^\circ\end{aligned}$$

$$\begin{aligned}\theta_3 &= 180^\circ - 45^\circ \\ &= 135^\circ\end{aligned}$$

$$\begin{aligned}\theta_4 &= 360^\circ - 45^\circ \\ &= 315^\circ\end{aligned}$$



4. Determine the exact values of the sine, cosine and tangent ratios for 210°

210° is in quadrant III which means $\theta_R = 210^\circ - 180^\circ = 30^\circ$

$$\begin{aligned}\sin 210^\circ &= \frac{y}{r} & \cos 210^\circ &= \frac{x}{r} & \tan 210^\circ &= \frac{y}{x} \\ &= -\frac{1}{2} & &= -\frac{\sqrt{3}}{2} & &= \frac{1}{\sqrt{3}}\end{aligned}$$

